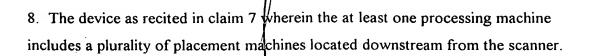


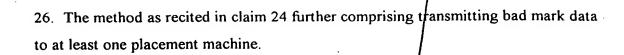
- 1. A device for processing multi-up panels comprising:
- a bad mark scanner for reading a surface of a multi-up panel; and
 a processor receiving at least one input from the scanner for determining a bad
 mark on the multi-up panel.
- 2. The device as recited in claim 1 wherein the bad mark scanner is located on an assembly line upstream from a placement machine, the placement machine receiving an input from the processor.
- 3. The device as recited in claim 2 further comprising a conveyor for transporting the multi-up panel between the bad mark scanner and the placement machine.
- 4. The device as recited in claim 1 wherein the scanner is a line scanner.
- 5. The device as recited in claim 1 further comprising a bar code reader for reading bar code information of the multi-up panel.
- 6. The device as recited in claim 1 further comprising a database for storing information related to circuits on the multi-up panel, the database accessible by the processor.
- 7. The device as recited in claim 1 wherein the bad mark scanner is located on an assembly line upstream from at least one multi-up panel processing machine for placing at least one component on the multi-up panel, the at least one multi-up panel processing machine receiving at least one input from the processor.



- 9. The device as recited in claim 7 further comprising a bar code reader assigned to the at least one processing machine
- 10. The device as recited in claim 7 further comprising a LAN connecting the at least one processing device and the processor.
- 11. The device as recited in claim 1 wherein the scanner has a resolution of 300x300 dots per square inch or fewer.
- 12. A circuit panel manufacturing assembly line comprising:
 - a circuit panel bad mark scanner;
 - a panel component placement machine separate from the scanner; and
- a panel conveyor located at least between the circuit panel scanner and the panel component placement machine for conveying the panels.
- 13. The circuit panel manufacturing assembly line as recited in claim 12 wherein the scanner is a line scanner.
- 14. The circuit panel manufacturing assembly line as recited in claim 12 further comprising a second component placement machine located next to the conveyor.
- 15. The circuit panel manufacturing assembly line as recited in claim 12 further comprising a bar code reader located next to the conveyor.
- 16. The circuit panel manufacturing assembly line as recited in claim 12 further comprising a bar code reader located between the scanner and the placement machine.

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- 17. The circuit panel manufacturing assembly line as recited in claim 12 further comprising a processor connected to the scanner and the placement machine.
- The circuit panel manufacturing assembly line as recited in claim 12 wherein the scanner is a stationary line scanner.
 - 19. The circuit panel manufacturing assembly line as recited in claim 12 further comprising a communications network connecting the scanner and the placement machine.
 - 20. The circuit panel manufacturing assembly line as recited in claim 19 wherein the communications network is a LAN.
 - 21. The circuit panel manufacturing assembly line as recited in claim 19 wherein the communications network is a wireless network.
 - 22. The circuit panel manufacturing assembly line as recited in claim 19 wherein the communications network is a WAN.
 - 23. The circuit panel manufacturing assembly line as recited in claim 19 wherein the communications network is a global information network.
 - 24. A method for determining bad marks on multi-up panels comprising the steps of scanning a multi-up panel with a scanner so as to form scan data; and determining a bad mark on the multi-up panel as a function of the scan data.
 - 25. The method as recited in claim 24 further comprising scanning a bar-eode on the multi-up panel.



- 27. The method as recited in claim 26 wherein the bad mark data is transmitted over a LAN.
- 28. The method as recited in claim 26 wherein the bad mark data is transmitted over a global communication network.
- 29. The method as recited in claim 24 wherein the scanning step includes line scanning the multi-up panel.
- 30. The method as recited in claim 24 further comprising conveying the panel on a conveyor belt.
- 31. The method as recited in claim 24 wherein the scanning step occurs at a resolution of or below 300x300dots per square inch.
- 32. A multi-up panel comprising a plurality of circuits, each circuit having a bad mark area for application of a bad mark, the multi-up panel being processed with the method of claim 24.